

Agricultural Dust Explosions in 2010*

There were 11 dust explosions reported in the U.S. in 2010 according to Kingsly Ambrose, Assistant Professor, Kansas State University. This compares to 8 in 2009 and a ten-year average of 9.8 explosions per year.

There were no fatalities and 17 injured.

The explosions were in 7 grain elevators, 2 feed mills, one corn wet mill and one corn cob processing plant.

The **probable ignition source** was identified in 3 cases as sparks, 1 exposed lightbulb filament, and 7 were unknown.

Fuel sources were identified as 8 from corn, and 3 from mixed feed.

Dust explosions occurred in eight different states: Illinois (4), 1 each in Louisiana, South Dakota, Nebraska, Oklahoma, Ohio, Iowa, and Wisconsin.

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* This report subject to revision as additional information is received.

REPORTED DUST EXPLOSIONS IN U.S. 2010

| <u>NO</u> | <u>DATE</u> | <u>COMPANY</u> | <u>ADDRESS</u> | <u>FACILITY</u> | <u>FATALITIES</u> | <u>INJURED</u> |
|-----------|-------------|----------------------------|------------------|------------------------|-------------------|----------------|
| 1 | 2010/04/13 | N/A | Waterproof, LA | Grain elevator | 0 | 0 |
| 2 | 2010/04/27 | Western Consolidated Co-Op | Twin Brooks, SD | Grain elevator | 0 | 0 |
| 3 | 2010/06/01 | ConAgra Foods | Chester, IL | Grain elevator | 0 | 4 |
| 4 | 2010/06/10 | CP Feeds | Valders, WI | Feed mill | 0 | 3 |
| 5 | 2010/09/07 | Grand Prairie Co-op | Tolono, IL | Grain elevator | 0 | 0 |
| 6 | 2010/11/30 | Tate & Lyle of Decatur | Heyworth, IL | Grain elevator | 0 | 3 |
| 7 | 2010/12/01 | Ursa Farmers Co-Op | Warsaw, IL | Grain elevator | 0 | 2 |
| 8 | 2010/04/13 | Simmons Feed Mill | Fairland, OK | Feed mill | 0 | 3 |
| 9 | 2010/04/27 | All Points Cooperative | Gothenburg, NE | Grain elevator | 0 | 0 |
| 10 | 2010/07/16 | Best Cob | Independence, IA | Corn cob processing | 0 | 0 |
| 11 | 2010/06/04 | Cargill | Dayton, OH | Corn wet milling | 0 | 2 |

TABLE 1. U.S. AGRICULTURAL DUST EXPLOSION STATISTICS

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | TEN YEAR TOTAL |
|-------------------|------|------|------|------|------|------|------|------|------|------|----------------------|
| Number | 9 | 8 | 8 | 6 | 13 | 9 | 7 | 19 | 8 | 11 | 98 |
| Fatalities | 1 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 6 |
| Injured | 7 | 8 | 8 | 4 | 11 | 8 | 6 | 9 | 12 | 17 | 90 |
| Type of Facility | | | | | | | | | | | |
| Grain Elevator | 4 | 6 | 4 | 1 | 7 | 5 | 5 | 14 | 4 | 7 | 57 |
| Feed Mill | 2 | 0 | 2 | 2* | 5 | 2 | 1 | 3 | 2 | 2 | 21 |
| Flour Mill | 0 | 0 | 1 | 0 | 1** | 0 | 0 | 0 | 0 | 0 | 2 |
| Other: | | | | | | | | | | | |
| Corn Milling, Dry | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corn Milling, Wet | 0 | 1 | 0 | 1* | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| Rice Mill | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 3 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 2 | 1 | 15 |

* Explosion occurred in raw grain storage facilities.

**Explosion occurred in separate bulk flour storage facility.

Source: Dr. Kingsly Ambrose, Kansas State University

TABLE 2. AGRICULTURAL DUST EXPLOSIONS BY COMMODITY HANDLED AT TIME OF EXPLOSION 2001-2010

| <u>COMMODITY</u> | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | <u>TEN YEAR TOTAL</u> |
|------------------------------|----------|----------|----------|----------|-----------|----------|----------|-----------|----------|-----------|-------------------------------|
| Corn | 5 | 5 | 6 | 3 | 7 | 5 | 4 | 14 | 4 | 8 | 61 |
| Soybeans | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Wheat | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 |
| Barley (malted) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Oats | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Beet pulp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corn starch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mixed feed | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 5 | 2 | 3 | 16 |
| Rice (Bran)(Flour)(Hulls) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wheat Flour | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 |
| Wheat (Starch)(Gluten) | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| Other | 1 | 1 | 0 | 2 | 2 | 1 | 1 | 0 | 1 | 0 | 9 |
| TOTAL EXPLOSIONS | 9 | 8 | 8 | 6 | 13 | 9 | 7 | 19 | 8 | 11 | 98 |

Source: Dr. Kingsly Ambrose, Kansas State University

TABLE 3. U. S. AGRICULTURAL DUST EXPLOSIONS LEADING STATES - 1958 to Date

| <u>STATE</u> | 1958-2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 10-YEAR TOTAL | 1958-2010 |
|--------------|-----------|------|------|------|------|------|------|------|------|------|------|---------------|-----------|
| Iowa | 74 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 4 | 3 | 1 | 15 | 89 |
| Illinois | 62 | 4 | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 2 | 4 | 16 | 78 |
| Nebraska | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 74 |
| Minnesota | 48 | 0 | 1 | 0 | 1 | 3 | 1 | 0 | 4 | 1 | 0 | 11 | 59 |
| Kansas | 45 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 7 | 52 |
| Texas | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 46 |
| Ohio | 28 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 7 | 35 |
| Missouri | 28 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 | 31 |
| Indiana | 23 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 27 |
| Louisiana | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 18 |
| South Dakota | 11 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 14 |
| Washington | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |

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